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Research Project Title

Utilization of Accelerated Pavement Tester (APT) for New Materials and Pavement Structure Research

Purpose of the Project

The purpose of the project is to utilize the accelerated pavement testing device and pit at the University of Tennessee, Knoxville (UTK) to investigate the many options to improve the pavement performance in Tennessee by use of new pavement materials, pavement structure, and pavement maintenance and rehabilitation methods. The primary objective of the research is to utilize the APT at UT-Knoxville campus to test and evaluate new pavement materials, pavement structures, and pavement rehabilitation and maintenance, including: 1) Geosynthetic-reinforced pavement base; 2) Inverted pavements or other innovative pavement designs; 3) Pavement maintenance treatments.

Scope and Significance

The scope of the research work includes: 1) To complete a synthesis of literature review and survey of APT testing of pavement materials, pavement structure, and pavement rehabilitation and maintenance treatments; 2) To perform APT testing on pavement materials, pavement structure, and pavement rehabilitation and maintenance treatments; 3) To perform laboratory testing of geosynthetic-reinforced pavement base materials; 4) To perform numerical simulations on geosynthetic-reinforced pavement and inverted pavement under traffic loading; 5) To establish a framework to incorporate APT testing results to the Mechanistic-Empirical Pavement Design Guide (MEPDG); 6)To make recommendations to TDOT specifications based on the results from the proposed research.

Expected Outcomes

This proposed research will significantly benefit TDOT in the following aspects: 1) Provide guideline on application of new pavement materials, structures, and treatments in Tennessee; 2) Provide alternative pavement design scenarios and technologies meeting certain requirements; 3) Decrease structural thickness of pavement and reduce construction cost; 4) Expect a significant extension of pavement service life; 5) Reduce long-term pavement maintenance cost.

The results from the study will documented in the reports and presented to TDOT staff and engineers. Based on the results and findings, recommendations will be made to TDOT specifications regarding use of new pavement materials, structures, and pavement treatments. This will facilitate the acceptance and use of these new materials and technologies in highway construction in Tennessee.

Time Period

The time period for the project is January 17, 2019 to November 30, 2020.

Contact Information

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